

REMARKS

Claims 1 and 3 currently remain in the application. None of the claims is herein amended.

Claims 1 and 3 were rejected under 35 U.S.C. 103 over Bergtsson in view of Hekal. For the reason presented hereinbelow, however, applicant believes that these claims are allowable and patentable.

The invention according to claim 1 is characterized as relating to a method of removing nitrate nitrogen from a vegetable juice, characterized as comprising the steps of (1) adjusting said vegetable juice so as to have sludge volume of 10% or less, (2) concentrating said vegetable juice to Brix concentration 20-40% to obtain a concentrate, (3) subjecting said concentrate to electrodialysis and (4) carrying out electrodialysis by flowing said concentrate at a linear speed of 0.5-10cm/sec on a membrane surface and at a temperature of 10°C or lower. As should be clear from the results of Table 1 and Fig. 2 of the specification, for example, it becomes possible to remove nitrate nitrogen from a vegetable juice with an improved workability only if the process is carried out strictly according to the conditions narrowly defined in this invention. Although Table 1 shows results of the examples with Brix 10%, 20% and 30%, results similar to the situation of Brix 30% have been obtained with Brix 40% and 50%.

Bergtsson describes methods of preparing deep-frozen vegetables by cutting or crushing (comminuting) vegetables, dewatering them by compression or centrifugation to separate them into a product stream with a dry matter content dewatered to 9-15% and a clear effluent containing less than 3% solids, thereafter condensing or discarding the effluent, mixing the condensed product with the aforementioned product stream if the effluent is condensed, and finally deep-freezing the particles (from column 1, line 57 to column 2, line 37). Bergtsson also describes treating said clear effluent with anion exchange resins or carrying out electrodialysis prior to the condensation process of the effluent in order to remove the undesirable anions contained therein (column 2, lines 2-10).

More in detail, Example 1 of Bergtsson describes chopping spinach containing about 7% solids, centrifuging said chopped spinach so as to separate it into a product stream (50 parts) having a solid content of 11.5% and an effluent stream (50 parts) having a solid content of about

2.5%, condensing the effluent stream to a solid content of 40% to be combined to the aforementioned product stream, and finally deep-freezing these pieces (column 2, lines 55-72). Example 2 of Bergtsson further describes treating the effluent stream with anion exchange resins prior to the step of concentrating in Example 1 (column 3, lines 5-8).

In summary, Bergtsson does NOT describe or hint at the steps of concentrating a vegetable juice and carrying out electro dialysis on the concentration, which characterize claim 1 of the present invention. Neither does Bergtsson describe or hint at the step of concentrating a vegetable juice to Brix 20-40% and subjecting the concentrated vegetable juice to electro dialysis or teach that nitrate nitrogen can be efficiently removed from a vegetable juice with a high workability if it is firstly concentrated to Brix 20-40% and then the concentrated vegetable juice is subjected to electro dialysis under specified conditions.

The flowcharts prepared by applicants and being submitted herewith as ATTACHMENT are intended to compare the invention according to claim 1 of the present invention with Examples 1 and 2 of Bergtsson.

Although the Examiner states regarding Example 1 of Bergtsson that a total solid content of about 26% is obtained since an effluent stream concentrated to 40% solids is combined 50/50 with a product stream at 11.5% solids (page 3, lines 4-6 of the Official Letter), applicant cannot clearly understand what is thereby intended by the Examiner because, as explained above, Example 1 of Bergtsson is teaching nothing but chopping spinach containing about 7% solids, centrifuging said chopped spinach such that it is separated into a product stream (50 parts) having a solid content of 11.5% and an effluent stream (50 parts) having a solid content of about 2.5%, condensing the effluent stream to a solid content of 40% and combining same to the aforementioned product stream. Thus, the final solid component becomes 13.2%.

The Examiner further states regarding Example 1 of Bergtsson that one of ordinary skill in the art would have been motivated to adjust the Brix value in order to obtain an end product that is desirable in taste, color, etc. with respect to the specific vegetable being used (page 4, lines 7-10 of the Official Letter), but applicant cannot clearly understand the relevancy of this statement because the vegetable juice is not being condensed to Brix 20-40% according to the present invention for the purpose of obtaining an end product that is desirable in taste, color, etc.

According to the present invention, the vegetable juice is condensed to Brix 20-40% for the purpose of efficiently removing nitrate nitrogen contained therein with a high workability.

The Examiner still further states regarding Example 1 of Bergtsson that Bergtsson et al teach the use of electrodialysis for removing nitrites and other undesirable anion from concentrated juice (page 5, lines 5-7 of the Official Letter), but applicant cannot clearly understand what is thereby intended by the Examiner because, as explained above, it is from the effluent stream prior to the step of condensing that nitrate nitrogen is removed by Bergtsson, not from the condensed product after the condensation step.

As for Hekal, cited by the Examiner, there is described a method of low temperature pasteurization by electrodialysis of a vegetable juice. Expressions such as vegetable juice, pH, temperature, flow rate and electrodialysis are employed dispersedly throughout the document but the characteristics (1) through (4) or the effects of the present invention as described above are not described or hinted at.

It is therefore to be concluded that both the invention according to independent claim 1 of the present application and the invention according to dependent claim 3 which is dependent from and inherits all of the limitations of independent claim 1 are not easily or obviously achievable by any ordinary person even skilled in the art, even if Bergtsson and Hekal cited by the Examiner are considered in combination and hence that both claims 1 and 3 should be deemed allowable.

In summary, it is believed that the present Amendment is totally responsive to the Office Action and hence that the application is in condition for allowance.

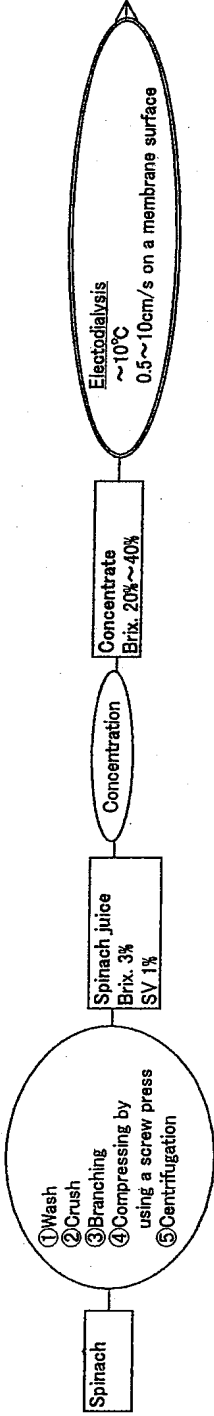
Respectfully submitted,
Weaver Austin Villeneuve & Sampson LLP
/kn/

Keiichi Nishimura
Registration No. 29,093

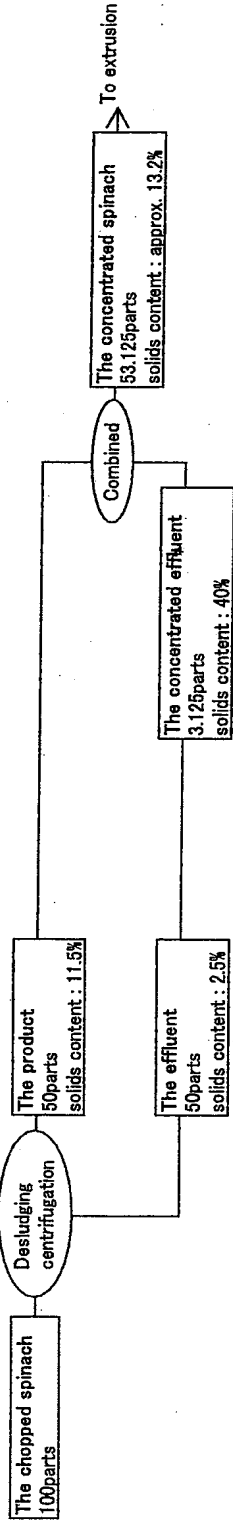
November 12, 2008
500 12th Street, Suite 200
Oakland, California 94607
Telephone: (510) 663-1100
Telefax: (510) 663-0920

ATTACHMENT

[Present invention]



[US3734751 / EXAMPLE 1]



[US3734751 / EXAMPLE 2]

